INFLUENCE OF AN EDUCATIONAL FILM ON DENTAL KNOWLEDGE AND ATTITUDES

BY

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INTRODUCTION

It is difficult to educate and motivate masses of people through visits to dental offices. As estimated 40 million Americans have never been to the dentist and many others visit dental offices only in emergency situations. The present dentist-population ratio of one to 2,000 may also be cause for concern. As the population continues to increase, heavy demands are expected for health services including dental care[1].

Producing more dentists and training more expanded duties, auxiliaries will be helpful, but these measures are unlikely to solve the problem completely, especially when one considers the overriding importance of the role which the individual must play in maintaining his own oral hygiene.

Dentistry has developed a greatly improved capacity to reduce the incidence of dental caries and periodontal disease. In addition, vigorous campaigns of dental health education are being pressed. New technology in the form of audiovisual aids has become available to promote dental education. Films are frequently shown in schools and dental health centers[2]. The American Dental Association has in one of its departments, the Bureau of Audiovisual Services, more than 3,000 copies of 425 different 16 millimeter motion picture films. In 1973 some 19,000 domestic and foreign requests for audiovisual materials were filled[1].

In regard to television, one of the broad communication systems that can reach the entire nation, the American Dental Association's Bureau of Dental Health Education prepares programs which are distributed

nationally every two months to 504 television stations. The Association also promotes National Children's Dental Health Week with films, television programs, and various printed materials[1].

One of the places where dental health education can be presented most effectively is the school, yet despite all the resources that are available, the results of those educational programs are questionable. In 1971 the House of Delegates of the American Dental Association called on the Association to assume responsibility for developing more effective dental health education materials for primary and secondary schools[3].

Although the Association has spent a great deal of money producing educational films, the effects of such films are essentially unknown. This study will investigate the short-term influence that one of these films, "Teeth Are For Keeping", exerts in the development of children's attitudes and knowledge toward dentistry.

The following hypotheses will be tested:

(1) There will be a significant increase in dental knowledge between a pre-test and post-test among children who viewed the film, (2) the attitudes of the children toward dentistry and the dental environment will improve significantly after viewing the film, and (3) the students will exhibit the same behavior as the characters in the film when they have an inspection visit of a dental office facility after viewing the film.

REVIEW OF THE LITERATURE

To supplement and sometimes to replace conventional modes of instruction, many audiovisual materials are available for use in dental health education, including motion picture films, audiotapes, television tapes, slides, etc.. This review of the literature will cover the following topics: evolution of dental health education, evolution of educational films, and use of films in modifying behavior.

Evolution of Dental Health Education

Health education in schools of the United States was introduced by two men: Horace Mann, "the Father of public schools", and Lemual Shattuck, a Massachusetts teacher and legislator[4].

In 1837 Mann published his annual report as a secretary of the original public school board of education. In that report and in the succeeding annual reports he expressed deep concerns about health education.

Shattuck recommended teaching every child early in life that to preserve his own life and health and the lives and health of others is one of the most important and abiding duties[5]. Mann and Shattuck were appealing for a program of health instruction from kindergarten through college. After those men, many others worked in the same cause.

In 1910 two leading dentists, Dr. W.G. Ebersole and Dr. Alfred C. Fones, organized school dental programs which served as examples during the early part of the twentieth century. In 1909 Dr. Ebersole had been appointed to the Committee on Oral Hygiene of the National Dental Association, precursor of the American Dental Association, and with this

appointment the direction of the Committee changed from a philanthropic to an educational one[6].

A model project was conducted in Cleveland Ohio, in 1910, with the hope of stimulating the public and the profession to accept a school health program more readily. The program consisted of three parts: dental examination of each student and notification to the parents of the result, a system of lectures on oral health to the pupils and then the parents, and establishment of a treatment clinic in the school to demonstrate the needs and the benefits of oral hygiene programs.

The physical condition and mental attitudes of the children, along with their performance, were recorded before, during and after the study. Any change was attributed to the dental health program. Of the total school population of 846 students examined, only three were free of dental decay. The children in the study group were given complete clinical care with all dental defects being treated and oral health education being presented in the classroom by a dentist. After one year the efficiency of the students was reported merely to have improved[6].

Dental health efforts increased in the years 1920 to 1939. The decade of the 1920's was characterized by the development of an official campaign by organized dentistry in regard to dental health education. The American Dental Association became extremely active in dental health education in the schools; this activity included the development of printed instructional material such as guide books for teachers, slides, films, outlines and new releases.

Interest in health education was apparent not only at the national level but also among local dentists. Classroom education of children was generally given by the teacher through toothbrush demonstrations, pamphlets, films, games promoting health, and poster contests[7]. However, in the 1950's the instruction was often provided by the dentist or dental hygienist. For the instruction of the children in the classroom and private office alike, material was available which had been prepared by educational specialists and commercial firms.

On February 7, 1949, National Children's Dental Health Day was inaugurated by the American Dental Association; and dental societies in 20 states, the District of Columbia, and the Territory of Hawaii reported that 95 communities were participating in such a program. In the following year the observance was extended and new groups became involved, notably the dental hygienists. It had now became obvious that the responsibility for dental health education must involve many persons such as teachers, school administrators, parents, children, parent-teacher groups, and dental societies[8].

At present the elementary school teacher plays, or should play, a vital role in dental health education. The principle reasons for this are the daily contact with children and the education that the teacher has in psychology and in the methodology of teaching[2,3].

The American Society of Dentistry for Children has greatly contributed to dental health education of the public[9]. As reported in the Journal of Dentistry For Children's P.R. Forum throughout 1974-1975,

this organization's teaching resources include such items as films, film-strips, pamphlets, slides, and posters. Also, the Women's Auxiliary to the American Dental Association has dental health education as its primary sponsorship. During 1974-1975, this national organization of dental wives reported approximately 4,881 individual showings of dental health educational films and film-strips to school children and other organizations[10]. These film presentations were in addition to the participation by this Auxiliary in many other dental health education projects such as puppet shows, newspaper articles, television programs, and distribution of teaching materials.

Dental public health officials and others are now sponsoring the training of teachers, school nurses, and hygienists to improve dental health education and to promote such goals as these:

1. Regular dental care.
2. Use of fluoride.
3. Proper cleaning of teeth.
4. Proper diet with restriction of refined carbohydrates.

Since the process of motivation and teaching oral hygiene are time-consuming for the dentist, auxiliary personnel and other aids such as audiovisual systems have been used in this area of dental health education. In this regard, various state boards of health have been training auxiliary personnel and have developed kits to facilitate the instruction. The dental health teaching kit is usually a self-contained unit which includes all materials essential for dental health education: models, slides, film-strips, instructions for conducting demonstrations, a projector

and collection of selected resource materials designed for use at the college level with students who are preparing to teach at all grade levels and for classroom teachers[11].

The fact that so much emphasis is placed on the audiovisual approach indicates the confidence that educators have in its teaching and motivational effectiveness[12].

Evolution of Educational Films

On October 23, 1896, the Koster and Bials Music Hall in New York City was the scene of the first showing of a motion picture in the United States. These first films were usually theatrical films. Credit for the development of motion pictures is generally given to Thomas Alva Edison, but the motion picture projector was the product of investigation carried on over many centuries and in many different countries and by many persons such as Aristotle, Archimedes, Galen, Leonardo da Vinci, and Dumont[13].

In 1919 Edison became very interested in the educational possibilities of the motion picture. He thought that it would be possible to teach every branch of human knowledge with the motion picture. Also, he felt that the school system would be completely changed in the following ten years. He firmly believed that children learned what they found interesting and he considered films as a way to make learning interesting. One of the first films produced in his studio was an instructional film on dental anesthesia.

Edison introduced the motion picture to the classroom and prepared educational films which would teach everything from mathematics to morality. All of these films were silent until the late 1920's when sound films first appeared[13,14].

The enthusiasm of men like Edison for the instructional value of the motion picture served to motivate many businessmen and educators to enter the budding field of visual education.

The first catalogue of educational motion pictures was published by George Kleine in New York in 1910. This publication contained 330 pages and listed 1,065 titles classified under thirty main topics. In the same year Kleine undertook the promotion of a school film service and with this objective, selected films at a meeting of the New York City Board of Education. Although his presentation was impressive, the plan was refused due to a lack of inexpensive portable motion picture projection equipment. Also, in 1910 the public schools of Rochester, New York, became the first to adopt films for regular instructional use and soon thereafter, organizations developed with the purpose of manufacturing inexpensive motion picture cameras and projection equipment for use by non-professionals, especially for those persons wishing to produce and display instructional films[14].

The Herman De Vry Company was one of the earliest companies to produce educational films and slides and to offer short motion picture reels for school use. Also, this company manufactured 35 mm projectors. The Victor Animatograph Company was one of the first to use sound in combination with film projection and the sound was recorded on discs. In

1919, Forest Ray Moulton and Rolin D. Salisbury, professors at the University of Chicago, and representatives of other universities such as Harvard, Columbia, and Michigan, formed an Association of 64 members to produce educational films[14].

When sound was introduced, many educators were opposed to this new development because they thought that the silent equipment would become useless. On the other hand, others liked the new invention and rejected the silent films. With the depression of the 1930's, educational films had only limited progress.

During the first half of this century, film distribution agencies were organized in state departments of education, college and university extension divisions, local and state museums, public and school libraries, and in other agencies. In addition, a number of cooperative and commercial rental libraries were organized throughout the country.

Between 1935 and 1940 the development of instructional technology was accelerated dramatically, principally because of the research and development funds provided by the Rockefeller Foundation and Payne Foundation of New York. Other factors included the attention given to the problem and the development of better materials and machines[14,15].

One of the first reports on audiovisual research was conducted at Johns Hopkins University in 1919.

The film entitled "Fit to Win" about venereal disease was shown to 5,000 persons. The informational and emotional value of this film was tested by using questionnaires. Pre-test questionnaires on venereal

disease were obtained from 425 persons and post-test examinations were received from 1,230 viewers. Also, interviews were conducted with thirty-five men during a period extending from six to eighteen months after the films was shown. Results from the questionnaires and interviews indicated that the film contained concise information about venereal disease but provided no evidence that attitude or behavior would be changed by the viewers[14].

In November 1927, Yale University attempted to determine the amount of time saved by the use of films on history, the amount of factual knowledge obtained by students, and the attitudes of the students toward the subject matter. Ten educational films were shown to 15 classes composed of 521 students. The control group used several kinds of materials except films. The general findings indicated that the use of films enriched the course of study and increased the students' learning about 19 per cent. This study demonstrated that children with average scholastic achievement with the aids of films learned as well as peers with records of excellent learning abilities.

In February, 1928, the Eastman Experiment began. It was a 12-cities study involving 11,000 students and 2,000 teachers in grade levels four to nine. This study used 20 instructional films, mainly about geography and general sciences. Films and textbooks were designed especially for this experiment. The units of instruction were carefully outlined and taught alike in similar classes, except that one group of classes utilized films for instruction. The teachers of the control group were asked to use instructional media other than films. Comprehensive

objective-type examinations were given to all students at the beginning and at the end of the experiment. The general conclusions of this investigation indicated that the educational films had an enormous educational potential in the classroom[2,14].

In 1932 the Carnegie Foundation study also determined that a significant increase in informational and conceptual learning takes place when films are used in combination with textbooks[14].

Use of Films in Modifying Behavior

Today the child is more visually oriented and often better informed than the child of 20 years ago. The reasons is that children start to watch television before kindergarten and acquire considerable information by this means.

Many teachers in schools attempt to make learning easy for the students. By visual communication schools have been able to bring the community into the classroom for the children. Visual aids have stimulated many students of all ages to see the educational process as an interaction in which the community and the students come to terms with each other, each by changing in some measure to accommodate the other. Teachers discovered that children of different ages and abilities were all capable of receiving effective visual communication and that attitudinal changes in some students were noticed. Teachers concluded that visual aids were an effective medium through which they could communicate their ideas[16].

Since the advent of audiovisual materials, many persons have attempted to determine their educational effects. In the last two years modeling films have been devised specifically to prepare the child for dental treatment. Melamed and Weinstein[17] investigated the value of audiovisual aids on behavior modification. They studied the management of child behavior during dental procedures, this guidance has been a major challenge to most dentists. A videotape was shown in which a four-year-old black child was undergoing a dental restorative procedure. The children who saw the film showed significantly fewer fear-related disruptive behavior during dental procedures. Because children learn much of their behavior by observing others, the technique of modeling and desensitization was applied to reduce the children's fears. In this study by Melamed and Weinstein, 14 children from five to nine years of age were selected, with only three having had any prior dental treatment. Each child was seen during three weekly visits to a dental clinic. At the first visit, the hygienist took radiographs and performed a prophylaxis. At the second visit the dentist completed an oral examination and determined the treatment needed, and at the third weekly session one or two restorations were placed. All children received local anesthetic injections and rubber dam application as shown in the film. The results showed that behavior can be modified by the use of films and the children in the experiment were more cooperative and showed a reduction in anxiety for dental treatment.

Axelband[18] in 1958 pointed out that Children's Dental Health Week has been helpful in educating children of pre-elementary and elementary school age and their parents. However, oral examinations of high school students have shown problems such as rampant dental caries, gingivitis, and poor oral hygiene which indicates that the educational techniques which have been used do not result in effective motivation for high school students. In Axelband's study, two assemblies were held on successive days, one in the morning and one in the afternoon, with different dentists presenting a talk supplemented by a film on some phase of dentistry. On the second day five table clinics on various aspects of dental health care were presented. Two gymnasiums were used, one for boys and one for girls. As much audiovisual material as possible was presented, with efforts being made to minimize use of the lecture method. After two years' experience it was found that the method produced good results, and there was increased interest in dentistry as a career.

In 1967, Bandura, Grusec, and Menlove[19] provided evidence that children's fears can be overcome through direct observation of a fearless peer model. A group of pre-school children who were afraid of dogs were exposed for eight sessions to a child who was playing with a dog. After the eighth session they were exposed to the dog themselves and the results were highly satisfactory in modifying the children's behavior. The present study was designed to explore the possibility that similar results could be obtained with filmed rather than live models. Forty pre-school children in the experimental group

were asked to approach a German shepherd dog which was in the play area. The children were asked to walk toward the dog as close as they wanted to go; if they approached to zero feet, they were asked to pet the dog and feed him. Of the forty children, only eighteen did not initially approach zero feet. These children were divided into two groups of nine. One group saw an eleven minute color film in which a German shepherd dog and another child of their age were playing, while the other group of nine was not exposed to this manipulation. The first scene of the film showed a boy who was ten years old, playing with the dog. Then a four year-old boy gradually approached the dog. The final scenes showed both boys playing together with the dog. The results revealed that eight of the nine in the film group became willing to approach, pet, and feed the live dog. In the control group, only three of the nine children approached to zero feet during this post-test. The authors are planning additional research to study the possibility and limitations of film therapy.

In 1972, Per Gjermo[20] conducted a study to evaluate the effect of an audiovisual instruction on the proper use of the toothbrush, gingival status, and the accumulation of dental plaque. This study included 175 school children aged 15 years from two schools. The group from one school was used as a control. The children at that age had a greater prevalence of gingivitis which was confirmed in the pre-experimental examination. Five weeks after the experiment began, the students in the study group showed an improvement of 22 to 32 per cent. After nine months the differences in the two groups were not satistically significant but

after 32 weeks, improvement in the experimental group was noted, especially among females.

Barnes[21] in 1973 conducted a study of the effectiveness in using videotapes in preventive dentistry as determined by changes in usage habits of toothbrushes, dental floss and dentifrice type. The study sample was composed of 435 male military personnel divided into two groups. The control group received no instructions while the other group viewed a 35-minute videotape presentation on dental health education. Barnes reported that the experimental group showed significant improvement in the number of individuals utilizing good quality toothbrushes; however, no improvement was noticed in the use of dental floss or in any change from a non-fluoridated to a fluoridated dentifrice. Barnes concluded that the televised tape presented to large groups of individuals on a one-time basis is somewhat useful in effecting behavioral changes aimed at the prevention of dental disease.

Muth[22], in studying 306 elementary school children in grades six through eight over a six-month period, found that the use of the phase microscope was less successful in motivating children to remove plaque than a slide-tape dental education program.

In 1975, Counsell and Ringelberg[23] conducted a study involving children in the fifth and sixth grades of four schools in two Florida counties. Counties were selected which had no dentists in private practice and no fluoridated water supplies. The project was conducted as a double blind, before-after study. The first group was activity-oriented with maximum learner participation. The second group was a

lecture-demonstration approach, including a movie. In group two, one investigator conducted all teaching sessions in order to reduce concomitant variation from having more than one instructor. Teachers were asked to avoid teaching dental health in the participating classes during the period of the study. No significant differences were found between the two groups.

METHODS AND MATERIALS

A total of 362 children were involved in the study, including 207 boys from the following five Boys' Clubs of Indianapolis, Indiana: Atkins Boys' Club, 3131 West 16th Street; Gorman English Avenue Boys' Club, 1400 English Avenue; LeGore Boys' Club, 5228 West Minnesota Street; Southside Boys' Club, East 30th Street; and 155 children from a parochial elementary school, St. Christopher's, 5375 West 16th Street, Indianapolis.

The participants from the Boys' Clubs ranged in age from 8 to 16, with an average age of 12 years. The age range of the students from the elementary school was from 9 to 14, also with an average age of 12. All of the children belonged to families of the lower social and economic class residing in the Indianapolis area. The distribution of the boys from the clubs was 60 per cent Caucasian and 40 per cent Negro while all of the elementary school children were Caucasian.

Each of the five Boys' Clubs, ranging in number from 30 to 47 children, was treated as a separate group. The students of the elementary school were treated as one large group.

One hundred and fifty-five children, roughly half of the total, were given a pre-test to measure their knowledge of dentistry and their attitudes toward dentistry. The club manager in the Boys' Club and the teachers in the school were asked to divide the students between the pre-test and post-test and the post-test only groups. The questions concerning the attitude toward dentists and appropriate behavior in the dental office were related to items numbered one to five. The questions about knowledge of preventive dental care were represented by items

number six to ten (refer to questionnaire at the end of this section). The other two hundred children served as a control group and were not given the pre-test. A post-test (see questionnaire at the end of this section) which was composed of the same questions as the pre-test was answered by all of the children to determine any changes in knowledge and attitude after viewing the movie. Also, the children visited a mobile dental unit (Appendix), which provided a dental office setting similar to that seen in the film. A total of 362 responses were obtained, although seven of these could not be used because the children's failure to follow directions.

"Teeth are for Keeping" is a 15-minute, 16 millimeter color and sound film produced by the American Dental Association. The story features two boys between 10 to 12 years of age, one of them black and the other Mexican-American. They are shown being chased by an unidentified pursuer and in their attempt to escape, they slip into a dental office. Two dentists, one black and the other Mexican-American, greet the boys in the office and introduce them to various dental procedures, in particular teaching them the basics of oral hygiene. The boys are allowed to play with the dental equipment and materials in the treatment room, particularly misusing the dental floss and study models.

Data have been unavailable as to whether or not children after viewing the film will behave in a dental treatment room similar to the boys' actions in the film.

After all of the children had seen the movie and answered the post-test questionnaire, they were invited to visit a mobile dental unit

for five minutes to determine whether they would act like the boys in the movie. Two of the five groups from the Boys' Clubs were not able to visit the mobile dental unit because of previous commitments for the unit. Another of the Boys' Clubs groups had their own dental clinic, so the dental mobile unit was not used for them. Therefore, two groups from the Boys' Clubs (72 boys) visited the mobile unit; twenty-five other boys visited their own dental clinic; and thirteen boys and twelve girls from the elementary school, visited the mobile dental unit.

The evaluators consisted of the author, a fourth year dental student, one or two supervisors at each individual club, and teachers at the elementary school. Aside from brief instructions for taking the pre-test, post-test and visiting the mobile dental unit, no other teaching was provided for the children, except the film. The dental student instructed the children on the correct mechanism for marking responses to multiple choice questions and he attempted to answer any procedural-type questions. When necessary, the supervisors and teachers provided help in administration and discipline but were not involved in the evaluation. The author operated the projector.

A mobile dental unit was provided by the Dental Division of the Indiana State Board of Health. It consisted of two dental units with standard and modern equipment, such as high and low speed air rotors, water and air syringes, aspirators, dental lights, etc.. In addition, toothbrushes, dental floss, plaster study models, and a dentiform were

placed within easy reach of the children during the tour of the dental treatment room. The Boys' Club dental clinic was comparably appointed with dental equipment and educational aids. The children were allowed to see and touch everything in the treatment area.

The actions of the children were compared to the following criteria of anticipated behavior, which were developed to measure the children's behavior in their visit to a dental office setting.

1. apathetic - children who were in the dental unit but their minds were in other places and they did not pay attention to the dental equipment and environment.

2. observant - children who were standing quietly, but primarily observing their companions' behavior.

3. inquisitive - children who were curious and wanted to touch and manipulate equipment and materials.

4. horseplay - children who were playing and mimicking behavior of characters in the film.

5. destructive - children who attempted to destroy the materials and cause damage to equipment.

During the visit to the treatment area of either the mobile dental unit or the Boys' Club Clinic, the various behaviors were noted. The

method of counting incidents of the various behaviors was discarded because taking notes gave a hint of supervision, and, furthermore, behaviors fell into patterns which were easily recorded by the evaluators after the visit.

Children were allowed to move freely about the treatment area. The dentists, represented by the author and the fourth year dental student, were in positions to observe the actions of the children but appeared to be occupied with other matters in the unit and in no way attempted to influence the children.

The following is the questionnaire given to the children:

DENTAL KNOWLEDGE AND ATTITUDE QUESTIONNAIRE

Read each of the following questions or statements carefully. Place an "X" before the phrase which most correctly answers the question.

---

1. Which do you think best describes a dentist?

___ a. Very friendly and helpful.

___ b. A nice person.

___ c. Someone who sometimes hurts you.

___ d. Someone who doesn't care if he hurts you.

2. How does the dentist treat you in his office?

___ a. Shows you things.

___ b. Talks to you.

___ c. Is interested mainly in his work.

___ d. Makes you feel he doesn't like you.

3. How do you act in the dental office?

___ a. Playing around and getting into things.

___ b. Stay in the waiting room but not be quiet.

___ c. Sit still and read.

___ d. Be scared.

4. How would you like to act in the dental office?

___ a. Do anything you want.

___ b. Do anything but only in the waiting room.

___ c. Sit quietly.

___ d. Be scared.

5. What do you like about going to the dentist's office?

___ a. It is a nice clean place to be.

___ b. There are lots of things to do in the waiting room.

___ c. The way the dentist treats me.

___ d. The feeling I get after having my teeth taken care of.

6. How important is it that I go to the dentist regularly?

___ a. Not important at all.

___ b. Important if I have problems with my teeth.

___ c. Important to go at least twice a year.

___ d. Important but doesn't have to be regularly.

7. How important is brushing and flossing?

___ a. Not important if you have good teeth.

___ b. Brushing several times a day is important but flossing is not.

___ c. Brushing after meals and flossing once a day is important.

___ d. I should brush and floss after each time I eat anything.

8. What is dental plaque?

___ a. Plaque is formed by germs and produces cavities.

___ b. Plaque is formed by food.

___ c. Plaque is formed by candy.

___ d. Plaque is good for teeth.

9. The cavity is produced by:

___ a. Germs or bacteria.

___ b. Eating too much candy.

___ c. Not seeing the dentist.

___ d. Having soft teeth.

10. Why should you use dental floss?

___ a. Clean bacteria between teeth.

___ b. Because the dentist told you.

___ c. It helps the gums.

___ d. To keep the spaces between the teeth open.

RESULTS

This section will be reported in four parts: (1) an analysis of the questionnaire responses, (2) comparison of the Boys' Clubs and school groups responses in the post-test, (3) analysis of questions by age group, and (4) behavior in the dental unit.

1. Analysis of Questionnaire Responses

A. Attitude Change from Pre-Test to Post-Test

Question #1: Which do you think best describes a dentist?

a. Very friendly and helpful.

b. A nice person.

c. Someone who sometimes hurts you.

d. Someone who doesn't care if he hurts you.

Question one showed that both groups felt that the dentist was "very friendly and helpful" (69 of 90 in the Boys' Club and 73 of the 89 in the school). This image of the dentist was reinforced by the film and in the post-test was chose 73 times in the Boys' Club and 79 times in the school (Table I). However, three each in the Boys' Club and in the school changed their choices to "b" (Table I). A Chi Square analysis revealed that these differences were not statistically significant ($X^2 = 5.01$, d.f. = 2, $p < 0.05$) (Appendix). The responses to alternatives "c" and "d" were combined to conform to cell size requirements for the Chi Square test.

Question #2: How does the dentist treat you in his office?

a. Shows you things.

b. Talks to you.

c. Is interested mainly in his work.

d. Makes you feel he doesn't like you.

On Question #2, 46 in the Boys' Club and 60 in the school chose "b" in the pre-test but this number was reduced to 38 and 44 in the post-test. The number choosing "c" was also reduced in the Boys' Club from 32 to 18 and from 11 to 6 in the school. Those choosing "a" increased from 10 to 31 in the Boys' Club and from 17 to 37 in the school (Table II). The direction of changes was from "b" and "c" to "a" equaling 38 and from "c" to "b" equaling 11 (Table II). The Chi Square analysis indicated significant differences ($X^2 = 79.74$, d.f. = 3, $p < 0.001$) (Appendix).

Question #3: How do you act in the dental office?

a. Playing around and getting into things.

b. Stay in the waiting room but not be quiet.

c. Sit still and read.

d. Be scared.

On Question #3 most students in both groups (139 in the pre-test and 144 in the post-test) chose "c". Substantially more students chose "a" in the post-test than pre-test (16 compared to 4), (Table III). In the school seven changed from "d" to "c" and in the Boys' Club six changed from "b" to "c" and six

from "c" to "b" (Table III). A Chi Square analysis revealed a statistically significant difference between the two groups ($X^2 = 20.14$, d.f. = 2, $p < 0.001$). Responses for alternatives "a" and "b" were combined because of small numbers (Appendix).

Question #4: How would you like to act in the dental office?

a. Do anything you want.

b. Do anything but only in the waiting room.

c. Sit quietly.

d. Be scared.

Question #4 had significantly more students choosing "a" on the post-test than pre-test in both groups (18 compared to 6). However, most students (144 in the pre-test and 132 in the post-test) chose "c", "Sit quietly", (Table IV). Thirteen students changed their answer to "a" while fifteen changed from "c" to either "b" or "a" (Table IV). ($X^2 = 34.11$, d.f. = 3, $p < 0.001$) (Appendix).

Question #5: What do you like about going to the dentist's office?

a. It is a nice clean place to be.

b. There are lots of things to do in the waiting room.

c. The way the dentist treats me.

d. The feeling I get after having my teeth taken care of.

On Question #5 most students chose "c" and "d" on both pre-test (148) and post-test (136) (Table V). There was no significant difference between the pre-test and post-test results in the school

even though eight students changed from "d" to "c" and five from "c" to "d" but in the Boys' Club seventeen less students chose "d" in the post-test while eight more chose "c" and eight more chose "b" in the post-test (Table V). The Chi Square analysis was significant at the 0.001 level. ($X^2 = 23.03$, d.f. = 3, $p < 0.001$ (Appendix).

B. Knowledge Change From Pre-Test to Post-Test

Questions #6 and #7 showed no statistical difference (Tables VI and VII).

Question #6: How important is it that I go to the dentist regularly?

a. Not important at all.

b. Important if I have problems with my teeth.

c. Important to go at least twice a year.

d. Important but doesn't have to be regularly.

In Question #6 there was no significant change from pre-test to post-test (Appendix) in the Boys' Clubs. Forty-eight chose "c" in the pre-test while 45 chose "c" in the post-test. In the school group 41 chose "c" in the pre-test while 47 chose the same alternative in the post-test, (Table VI). However, eight of the Boys' Club group changed from "c" to "b" and seven from "b" to "c", while five in the school group changed from "b" to "c" and four from "b" to "d" (Table VI).

Question #7: How important is brushing and flossing?

a. Not important if you have good teeth.

b. Brushing several times a day is important but flossing is not.

c. Brushing after meals and flossing once a day is important.

d. I should brush and floss after each time I eat anything.

In Question #7 there was no significant changes from pre-test to post-test (Appendix). In the Boys' Club 51 boys chose "c" in the pre-test and the same number in the post-test, in the school group 48 children chose "c" in the pre-test and 53 in the post-test (Table VII). Major changes were from "d" to "c" five in the Boys' Club and 11 in the school but also from "c" to "d" (3 and 5) and from "c" to "b" (4 and 6) (Table VII).

Question #8: What is dental plaque?

a. Plaque is formed by germs and produces cavities.

b. Plaque is formed by food.

c. Plaque is formed by candy.

d. Plaque is good for teeth.

On Question #8 responses were scattered for both groups. Responses "a" and "c" were chosen about an equal number of times (62 and 65) while "b" and "d" combined, were chosen 51 times (Table VIII), The largest shift was from "a" to "c" pre-test to post-test. Forty students shifted to "c" on the post-test while 24 shifted to "a" only 12 shifted to "b" and 5 to "d". Question 8 had the

most shifts of any of the ten questions and the shifts were scattered over both groups, (Table VIII). The Chi Square analysis was significant at the 0.001 level. ($X^2 = 17.79$, d.f. = 3, $p < 0.001$) (Appendix).

Question #9: The cavity is produced by:

a. Germs or bacteria.

b. Eating too much candy.

c. Not seeing the dentist.

d. Having soft teeth.

On Question #9 the predominant choices were "a" and "b". Slightly more children in the Boys' Club chose "b" in both pre- and post-test (40 to 26) (39 to 35) while the school participants preferred "a" (44 to 38 and 51 to 31) (Table IX). The principle shift was from "b" to "a", 22 students changing answers, however, 11 students changed from "a" to "b". Other changes were scattered (Table IX). A Chi Square analysis revealed that these changes were significant. ($X^2 = 7.85$, d.f. = 2, $p < 0.05$) (Appendix).

Question #10: Why should you use dental floss?

a. Clean bacteria between teeth.

b. Because the dentist told you.

c. It helps the gums.

d. To keep the spaces between the teeth open.

On Question #10 in the Boys' Club 50 students chose "a" in the pre-test and 43 in the post-test. In the school group 65 chose

"a" in the pre-test and 71 in the post-test (Table X). In the Boys' Club 5 changed from "a" to "c", in the school group 7 students changed from "c" to "a" and four from "a" to "c" (Table X). The Chi Square analysis was significant at the 0.05 level. ($X^2 = 10.31$, d.f. = 3, $p < 0.05$) (Appendix).

2. Comparison of The Boys' Club and School Groups Responses in the Post-Test

In eight of the ten questions, there was a statistically significant difference in the response pattern of the four groups (Boys' Club pre- and post-tests, Boys' Club post-test only, School pre- and post-tests, School post-test only) on the post-test.

On Question #1 the overwhelming choice of all groups was "a". The school group that took the post-test only had a slightly smaller percentage of "a" and larger percentage of "b" choices than the other groups. Choices "c" and "d" were chosen by only 16 of the 354 participants in the study and so were combined to obtain a larger cell size. ($X^2 = 13.38$, d.f. = 6, $p < 0.05$). (Appendix)

On Question #2 the combined groups chose "b" 174 times and "a" 105 times. The school group which had the post-test only chose "a" three times and had the largest percentage choice of "b". The Boys' Club post-test only group had the largest number of "c" choices. Only nine students chose "d". ($X^2 = 49.20$, d.f. = 9, $p < 0.001$) (Appendix).

On Question #3, 265 of the 355 students chose the alternative "c" and only 33 chose alternative "d". Choices "a" and "b" were combined also because of small numbers. (X^2 = 36.14, d.f. = 6, $p < 0.001$) (Appendix).

On Question #4, 246 students chose "c". There was no significant difference between the groups (Appendix).

On Question #5, 123 students chose "c" and 147 chose "d". There was no significant difference between the groups (Appendix).

On Question #6, 183 students chose "c". The Boys' Club chose alternative "b" more frequently. The school group chose alternative "c" most often. Only 31 of the 355 answered alternative "d" and only 6 chose alternative "a". Choices "a" and "b" were combined for larger cell numbers. (X^2 = 36.74, d.f. = 6, $p < 0.001$) Appendix).

On Question #7, the groups chose "c" 210 times. The post-test only Boys' Club group chose "a" and "b" 34 times while the other three groups combined, chose them only 28 times. Choices "a" and "b" were combined because of small numbers. (X^2 = 24.60, d.f. = 6, $p < 0.001$) (Appendix).

On Question #8 in the school group, alternative "a" was chosen by 81, while "c" was chosen by 88 in the Boys' Club. Alternative "d" was chosen by only 23 of the 355 students. (X^2 = 22.61, d.f. = 9, $p < 0.01$) (Appendix).

On Question #9, the school group chose alternative "a" 106 times, while the Boys' Club chose alternative "b" in 88 times. The

alternatives "c" and "d" were combined and were chosen only by 48 of the 355 students. ($X^2 = 39.12$, d.f. = 6, $p < 0.001$) (Appendix).

On Question #10 the groups chose alternative "a" 228 times. Forty-six Boys' Club students chose "c". The other answers were scattered (Appendix).

3. Analysis of Questions by Age Groups

Further analyses of questions 3, 4, 5 and 8 were performed to note whether differences in age (from 8 to 16) influenced the children's responses.

Question #3: How do you act in the dental office?

a. Playing around and getting into things.

b. Stay in the waiting room but not quiet.

c. Sit quietly, and read.

d. Be scared.

Except for four children who switched to alternative "a" in the post-test and six who chose the answer when given the post-test only, the overwhelming choice was "c". No definite age patterns were noted.

Question #3 - Boys' Club. The changes between pre-test and post-test were fairly evenly spread across ages, however, they seemed to be somewhat greater in the 9 to 13 ages. The predominant answer was "c" with scattered choices across the other three alternatives.

Question #3 - School. With a few exceptions, the students chose alternative "c" in pre-test and post-test; the major exception was that seven of the 12-year-olds chose "b" or "d" in the pre-test; but only one child chose "d" in the post-test.

Question #4: How would you like to act in the dental office?

a. Do anything you want.

b. Do anything but only in the waiting room.

c. Sit quietly.

d. Be scared.

When asked how they preferred to act, the participants still chose alternative "c" but there were a few more exceptions than in question 3.

Question #4 - Boys' Club. The changes in choices between the pre-test and post-test were again scattered across all ages, with the 11 to 13-year-olds having slightly more changes. Again "c" was the predominant choice. No age pattern was noted for the other choices.

Question #4 - School. Especially in the pre-test, alternative "c" was the overwhelming choice, again the exception seemed to be the 12-year-olds where the post-test showed spread of choices.

Question #5: What do you like about going to the dentist's office?

a. It is a nice clean place to be.

b. There are lots of things to do in the waiting room.

c. The way the dentist treats me.

d. The feeling I get after having my teeth taken care of.

The favorite choices were "c" and "d". Among the students at the Boys' Club there were slightly more who chose "b" than in the school where more students chose "a".

Question #5 - Boys' Club. This question has the greater number of changes between the pre-test and post-test. Ages 8 to 13 had more changes than the 14 to 16-year-old groups. Choice "d" was the most prevalent answer, but "c" was favored by the 13 and 14-year-old groups.

Question #5 - School. The 9 to 10 year-olds seemed to have preference to choices "c" or "d". In the 11 to 12 ages, the preference was "d" rather than "c". The changes between the pre-test and the post-test were minimal.

Question #8: What is dental plaque?

a. Plaque is formed by germs and produces cavities.

b. Plaque is formed by food.

c. Plaque is formed by candy.

d. Plaque is good for teeth.

Choices were scattered with the predominant choices being "c" and "a".

Question #8 - Boys' Club. Changes between pre-test and post-test again were scattered with no predominant pattern according to age. Choice "c" is the most prevalent choice and the ages 8 to 12 group had a very large number of "a" and "b" choices.

Question #8 - School. The prevalent choice was "a" especially among the students who were 12 and older. The choices were spread for the younger children with many "c" choices.

4. Behavior in the Dental Unit

While the students almost universally felt more at ease in the dental office, they did distinguish between the acceptable (inquisitive) behavior, and the unacceptable (destructive) behavior. Like the characters in the film, the children in the study manipulated the dental chair, slow and high speeds, they used dental floss correctly (three boys), examined the study models on dentiform, played flute with the syringes, mimicked being astronauts, turned knobs. However, they did not throw the study models around, wind dental floss around another student in the dental chair or do anything else of a destructive nature. Only four students did not take part in the fun and only three students used the rough language of the characters in the film. Several students asked to spend additional periods in the dental unit.

The behavior that the children in the study groups exhibited during the film was varied in the different groups; however, the identification with the actors was apparent. In groups where many of the boys were black, they seemed to enjoy the film; they laughed at the more exaggerated scenes and their attention was held during the 15-minute duration of the film. On the other hand, the predominantly white groups did not seem to enjoy the film as universally. The following is a summary of the author's impression of the behavior in each group.

Gorman English Boys' Club

All of the 30 children were Caucasians between 8 to 16 years of age, with an average of 13 years. The director was not able to get the boys' complete attention to the experiment because they appeared to be thinking about a basketball game to be played after the film presentation. During the film presentation they were apathetic; they did not laugh at the scenes that the other groups thought were funny. The film was shown in the library of the club. Because the mobile dental unit was not available for this session, this group had no visitation to the dental office.

Atkins Boys' Club

All of the 47 boys here were black. The discipline and the environment here were completely different from the situation at the Gorman Club. They had very good organization and the boys were friendly and interested. Before the presentation they asked me what kind of film was to be presented. The film was shown in the library and two supervisors and my assistant took care of the instructions and discipline. During the pre-test some of the boys asked about words which were unfamiliar to them, such as "plaque". After the pre-test the whole group was allowed to go to the library for the film presentation. The children seemed really to enjoy the film and were interested in it. Their

laughter filled the room during some of the more exaggerated scenes and yet they were very disciplined during the film and did not talk to each other. During the post-test the children were cooperative and attentive. It did not take as long for the children to finish the post-test as the pre-test.

After the post-test all 47 children were taken through the dental mobile unit in groups of five. The author and the assistant permitted the children to explore the mobile unit themselves while they pretended to talk with each other. The behavior of the children was like that of the boys in the film; they moved the dental chair up and down, forward and back. Three of them pretended to be astronauts and manipulated the "space ship". In spite of the curiosity normal in children of that age, they did not harm anything but were merely inquisitive. They turned on the air rotors and pressed all the buttons they could find. Two of them played with the aspirator like a flute as the characters did in the movie. The students stood in line to sit and manipulate the dental units. Earlier touring groups were not permitted to discuss with later groups what they had done.

LeFore Boys' Club

The reactions to the movie of the 39 boys from this club, all Caucasians, were again different from those of the other

clubs. One factor that no doubt influenced them was the strict discipline that the director exerted. He did not permit them any freedom. In my opinion, they wanted to play and instead, were forced to see the film. They were ordered to be in the library, but as soon as the director left the room, they started to leave until one of the attendants came to restore discipline. Once the film began, the majority seemed to enjoy the action and laughed at some of the scenes, especially when one of the boys in the film called the other "stupid". As with the other predominantly white clubs, the younger boys were reacting with the characters in the film, the older boys were more quiet.

Twenty-five of the children visited the dental unit in groups of four. The behavior was very similar to that of the Atkins group, the only difference being that three of the boys took a piece of dental floss and used it to clean their own teeth as they had seen the boys do in the movie, rather than misusing it. The curiosity was the same but no harm was done to any of the materials or equipment. Four of the boys were very quiet and did nothing but stand and watch.

Wheeler Boys' Club

This group consisted of 44 black boys with an average age of 13 years. They were very well disciplined, friendly and cooperative. The film was projected in a special activities room.

The boys paid close attention to the movie and often laughed. The identification with the actors was obvious, even though there were some older boys between 14 to 15. After viewing the film, 25 of them visited the dental office. The club has two dental units of their own so the children were familiar with the equipment. They behaved like the other boys in the clubs, not harming the material and equipment but being very inquisitive.

Southside Boys' Club

This group consisted of 42 Caucasians and two blacks, the majority of them being between 9 to 12 years of age. The childrens' behavior was very good. Two supervisors helped us during the entire procedure and the film was shown in the gymnasium. The acoustics were not good which may explain why the boys did not seem to enjoy the film as some other groups did. There was no laughing at any of the scenes. Some of the boys asked me beforehand what kind of movie we had, and it seemed to me that they had been exposed to many films. This was one of the groups that did not visit the dental mobile unit because it was not available.

St. Christopher Primary School

Five classes were combined into one large group of 155 students, all Caucasians and all between 9 and 14 years of age. Two-thirds of the children were girls. The children were very

well disciplined, as is often typical of parochial schools. Five teachers helped me, one for each group, and the movie was projected in the music room. During the movie the younger children laughed at some scenes, while the older ones seemed to be watching intently, perhaps trying to learn. The school environment seemed especially appropriate for a learning experience but the students did not seem to identify with the actors, perhaps because so many of them were girls. This was one of the groups that were very well controlled and friendly. After the movie 25 of the children, including 12 girls, visited the mobile dental unit. As in the earlier groups, the children were inquisitive but did not harm any materials or equipment.

In none of the groups did the investigators note any of the pranks seen in the film, such as using dental floss to tie a companion to a dental chair and breaking study models.

In conclusion, all three hypotheses can be accepted but with the reservation that the changes were mixed; some which were expected took place while others which were expected, did not.

TABLES

TABLE I

Number of Children Selecting Different

Answers to Question #1

Choice Selected	Number of Children Before Viewing the Film		Number of Children After Viewing the Film		Number of Children Changing Answer
	Boys' Club	Elementary School	Boys' Club	Elementary School	
a	69	73	73	79	+ 10
b	13	14	13	9	- 5
c	3	1	2	1	- 1
d	5	1	2	0	- 4

A Chi Square test demonstrated that there was not a statistically significant change ($p \leq 0.05$) in the number of children who modified their choices after viewing the film. For details of the statistical analysis see Appendix.

Question Number	Change	Boys' Clubs	Elementary School	Total
1	a --> b	3	3	6
	b --> a	4	8	12
	c --> a	2	1	3
	d --> a	1	0	1
	d --> c	1	1	2
	Totals	11	13	24

TABLE II

Number of Children Selecting Different

Answers to Question #2

Choice Selected	Number of Children Before Viewing the Film		Number of Children After Viewing the Film		Number of Children Changing Answer
	Boys' Club	Elementary School	Boys' Club	Elementary School	
a	10	17	31	37	+ 41
b	46	60	38	44	- 24
c	32	11	18	6	- 19
d	1	1	2	2	+ 2

A Chi Square test demonstrated that there was a statistically significant change ($p \leq 0.05$) in the number of children who modified their choices after viewing the film. For details of the statistical analysis see Appendix.

Question Number	Change	Boys' Clubs	Elementary School	Total
2	a --> b	1	2	3
	b --> a	11	21	32
	b --> c	2	0	2
	b --> d	1	1	2
	c --> a	4	2	6
	c --> b	8	3	11
	Totals	27	29	56

TABLE III

Number of Children Selecting Different

Answers to Question #3

Choice Selected	Number of Children Before Viewing the Film		Number of Children After Viewing the Film		Number of Children Changing Answer
	Boys' Club	Elementary School	Boys' Club	Elementary School	
a	0	2	7	2	+ 12
b	8	4	10	5	+ 3
c	68	71	66	78	+ 5
d	13	12	6	4	- 15

A Chi Square test demonstrated that there was a statistically significant change ($p \leq 0.05$) in the number of children who modified their choices after viewing the film. For details of the statistical analysis see Appendix.

Question Number	Change	Boys' Club	Elementary School	Total
3	a --> b	0	1	1
	b --> a	1	0	1
	b --> c	6	2	8
	c --> a	2	1	3
	c --> b	6	1	7
	c --> d	1	0	1
	d --> a	1	0	1
	d --> b	3	1	4
	d --> c	2	7	9
	Totals	22	13	35

TABLE IV

Number of Children Selecting Different

Answers to Question #4

Choice Selected	Number of Children Before Viewing the Film		Number of Children After Viewing the Film		Number of Children Changing Answer
	Boys' Club	Elementary School	Boys' Club	Elementary School	
a	2	4	9	9	+ 12
b	9	9	13	9	+ 4
c	75	69	66	66	- 12
d	3	5	1	5	- 2

A Chi Square test demonstrated that there was a statistically significant change ($p \leq 0.05$) in the number of children who modified their choices after viewing the film. For details of the statistical analysis see Appendix

Question Number	Change	Boys' Club	Elementary School	Total
4	a --> c	1	1	2
	b --> a	2	2	4
	b --> c	2	2	4
	c --> a	2	5	7
	c --> b	6	2	8
	c --> d	1	1	2
	d --> a	2	0	2
	d --> c	2	1	3
	Totals	20	19	39

TABLE V

Number of Children Selecting Different

Answers to Question #5

Choice Selected	Number of Children Before Viewing the Film		Number of Children After Viewing the Film		Number of Children Changing Answer
	Boys' Club	Elementary School	Boys' Club	Elementary School	
a	9	11	11	11	+ 2
b	5	6	12	9	+ 10
c	23	40	33	38	+ 8
d	53	32	34	31	- 20

A Chi Square test demonstrated that there was a statistically significant change ($p \leq 0.05$) in the number of children who modified their choices after viewing the film. For details of the statistical analysis see Appendix.

Question Number	Change	Boys' Club	Elementary School	Total
5	a --> b	0	1	1
	a --> d	1	3	4
	b --> c	2	2	4
	b --> d	0	2	2
	c --> a	0	3	3
	c --> d	1	5	6
	d --> a	3	1	4
	d --> b	8	1	9
	d --> c	6	8	14
	Totals	21	27	48

TABLE VI

Number of Children Selecting Different

Answers to Question #6

Choice Selected	Number of Children Before Viewing the Film		Number of Children After Viewing the Film		Number of Children Changing Answer
	Boys' Club	Elementary School	Boys' Club	Elementary School	
a	2	0	4	0	+ 2
b	32	40	30	34	- 8
c	48	41	45	47	+ 3
d	7	8	10	8	+ 3

A Chi Square test demonstrated that there was not a statistically significant change ($p \leq 0.05$) in the number of children who modified their choices after viewing the film. For details of the statistical analysis see Appendix.

Question Number	Change	Boys' Club	Elementary School	Total
6	a --> c	1	0	1
	b --> c	7	5	12
	b --> d	6	4	10
	c --> b	8	2	10
	d --> b	1	1	2
	d --> c	0	3	3
	Totals	23	15	38

TABLE VII

Number of Children Selecting Different

Answers to Question #7

Choice Selected	Number of Children Before Viewing the Film		Number of Children After Viewing the Film		Number of Children Changing Answer
	Boys' Club	Elementary School	Boys' Club	Elementary School	
a	2	0	4	0	+ 2
b	8	8	11	10	+ 5
c	51	48	51	53	+ 5
d	28	33	23	26	- 12

A Chi Square test demonstrated that there was not a statistically significant change ($p \leq 0.05$) in the number of children who modified their choices after viewing the film. For details of the statistical analysis see Appendix.

Question Number	Change	Boys' Club	Elementary School	Total
7				
	a --> d	1	0	1
	b --> a	2	0	2
	b --> c	0	3	3
	b --> d	1	0	1
	c --> a	1	0	1
	c --> b	4	6	10
	c --> d	3	5	8
	d --> b	4	2	6
	d --> c	5	11	16
	Totals	22	27	49

TABLE VIII

Number of Children Selecting Different

Answers to Question #8

Choice Selected	Number of Children Before Viewing the Film		Number of Children After Viewing the Film		Number of Children Changing Answer
	Boys' Club	Elementary School	Boys' Club	Elementary School	
a	26	41	24	38	- 6
b	24	11	18	19	+ 2
c	28	23	39	26	+ 15
d	11	14	8	6	- 11

A Chi Square test demonstrated that there was a statistically significant change ($p \leq 0.05$) in the number of children who modified their choices after viewing the film. For details of the statistical analysis see Appendix.

Question Number	Change	Boys' Club	Elementary School	Total
8	a --> b	0	4	4
	a --> c	10	10	20
	a --> d	0	1	1
	b --> a	6	3	9
	b --> c	6	0	6
	b --> d	1	1	2
	c --> a	2	7	9
	c --> b	2	1	3
	c --> d	1	1	2
	d --> a	2	4	6
	d --> b	0	5	5
	d --> c	3	1	4
	Totals	33	38	71

TABLE IX

Number of Children Selecting Different

Answers to Question #9

Choice Selected	Number of Children Before Viewing the Film		Number of Children After Viewing the Film		Number of Children Changing Answer
	Boys' Club	Elementary School	Boys' Club	Elementary School	
a	26	44	35	51	+ 16
b	40	38	39	31	- 8
c	18	3	12	3	- 6
d	4	4	3	4	- 1

A Chi Square test demonstrated that there was a statistically significant change ($p \leq 0.05$) in the number of children who modified their choices after viewing the film. For details of the statistical analysis see Appendix.

Question Number	Change	Boys' Club	Elementary School	Total
9	a --> b	4	7	11
	a --> c	2	2	4
	a --> d	0	2	2
	b --> a	8	14	22
	b --> c	1	1	2
	b --> d	0	1	1
	c --> a	2	0	2
	c --> b	3	2	5
	c --> d	0	1	1
	d --> a	1	2	3
	d --> b	1	1	2
	d --> c	1	0	1
	Totals	23	33	56

TABLE X

Number of Children Selecting Different

Answers to Question #10

Choice Selected	Number of Children Before Viewing the Film		Number of Children After Viewing the Film		Number of Children Changing Answer
	Boys' Club	Elementary School	Boys' Club	Elementary School	
a	50	65	43	71	- 1
b	15	3	11	4	- 3
c	13	10	21	7	+ 5
d	11	11	13	7	- 2

A Chi Square test demonstrated that there was a statistically significant change ($p \leq 0.05$) in the number of children who modified their choices after viewing the film. For details of the statistical analysis see Appendix.

Question Number	Change	Boy's Club	Elementary School	Total
10	a --> b	3	0	3
	a --> c	5	4	9
	a --> d	0	1	1
	b --> a	3	1	4
	b --> c	3	1	4
	c --> a	2	7	9
	c --> d	2	0	2
	d --> a	0	2	2
	d --> b	1	2	3
	d --> c	1	0	1
	Totals	20	18	38

DISCUSSION

The purpose of this experiment was to determine whether a specially developed film, "Teeth are for Keeping", would increase the dental knowledge and improve the attitude toward dentistry of those who viewed the film. A second purpose was to determine whether the students would exhibit the same behavior in the dental unit that the boys exhibited in the film. To test changes in knowledge and attitude, a questionnaire was designed.

The first five questions in the questionnaire were concerned with attitude, and the last five with knowledge. A total of 122 students visited the dental unit after taking the post-test and during the visit they were permitted to do as they pleased.

There were different reactions among the Boys' Club groups and the school group during the film presentation, just as there were shifts in answers from pre-test to post-children. The Boys' Club are places where boys play or practice sports, and these activities had to be interrupted so that the boys could attend the film presentation and answer the questionnaire. Children at that age are very complex, they are likely to separate school from other activities, so play after school is a completely different activity from learning. This may at least partially explain an attitude which was generally different from that of the school group also, some children were tired, since in three of the clubs the children had to interrupt a basketball game to attend the film presentation.

The film was shown in the Boys' Club in the evening, the students were forced to attend the film, and many of them had their thoughs elsewhere. On the other hand, children in the school group viewed the film

during the morning, they were controlled very well and one of the teachers read them the instructions for answering the questionnaire. Psychologically the children were prepared to learn.

The author could see the difference in these groups. The school group was more conscientious in answering the questions. In the Boys' Clubs group, some children apparently answered only because they were required by their supervisors to cooperate.

The environment and the hour of the presentation undoubtedly exerted some influence, and if this study were to be conducted again the film would be shown during the morning when children are fresh and can think much better. In the Boys' Club groups the control of the boys was somewhat more difficult than in the school group where the teachers controlled the students. The age range in the Boys' Club group was spread from 8 to 16 whereas in the school group children were in the approximate by the same age group as the boys in the film.

If the study were to be repeated, I would advocate having a group which did not answer the questionnaire or see the film. This group would be taken to visit the dental unit to compare their behavior with that of the study group. It would also be interesting to find out what children would do in a normal dental office instead of a dental mobile unit.

Congnitive Factors Shown By the Answers to the Pre- and Post-Test

In the responses to question #1, it seems that on the basis of previous dental experiences children in both groups felt that the dentist was very helpful and friendly, and this image was reinforced by the film.

This was indicated by the shifts of the different responses to "a". Few students chose the other responses and "a" was far and away the choice of students in both groups. Several students did shift from "a" to "b" and the only explanation seems to be that the dentist in the experiment was not helpful because he did not answer questions about the questionnaire.

In the responses to question #2, many students shifted to answer "a", the other common choice was "b". These choices and shifts may be explained because the dentists in the film were talking and showing things to the boys.

In response to question #3, both groups chose alternative "c" more often in both pre- and post-test perhaps indicating a relaxed attitude toward the dental office. The direction of the shifts toward a more relaxed atmosphere but the number of the shifts was small. The overwhelming choice of "Sit quietly" may be due to previous experiences rather than that what was shown in the film. Thus it would seem that the 15-minute film did not prevail over hours of experience in the dental office as far as attitude change is concerned. The answers to this question are in contrast to what happened in the dental unit where almost everyone joined in the action.

In response to question #4, "c" was the overwhelming choice, changes in other responses, even when they were statistically significant, were very small in number and thus of not great consequence. The shifts from "d" and "c" showed the positive influence of the film, creating a scene of familiarity of both groups with the office environment.

Relative to question #5, there was a significant shift in the Boys' Club from "d" to "c". Perhaps the boys like the dentist in the film, because they were both from minority groups: one black and one Mexican-

American. In the school group there was a slight shift that indicates less identification with the dentist in the film.

The responses to question #6 indicate that the students think they must visit the dentist office at least twice a year. Most students chose alternative "c" which is the correct answer. In the school group only 9 chose "a" and "b". These responses can be expected from students who go to the dentist only when they have problems. It seems that the school group had the concept of regular dental visits more clearly in mind than the Boys' Clubs groups.

As to question #7, the direction of the shifts from pre- to post-test was spread. In both groups the alternative "c" was chosen most often. The alternative "a" and "b" were chosen only ten times by the school group, in the post-test indicating that they got the concept from the film, if they had not had it from previous experiences. The Boys' Clubs group had a few shifts but they were not enough to be significant.

Responses to question #8 showed some shifts to the correct answer "a", between the pre-test to post-test in both groups. The concept of "plaque" seems a very difficult one to handle for young children, and the school group students seemed to handle it better than the Boys' Clubs participants. More questions were asked of the investigator about the word "plaque" than any other term on the test. There seems to be a gradually expanding understanding of plaque that comes with hearing the term and with age; the older school children generally had a much better understanding of plaque than the younger children in both groups.

This question had the greatest spread in the answers, and only in the 12 to 14 years old elementary school students did a majority chose "a", the correct answer. In the Boys' Clubs group even the 12-year-old and older children were spread over the four alternatives, indicating an unsophisticated or even erroneous concept of plaque. This was perhaps the only question in which the age appeared to be a significant factor.

In response to question #9, the shift of the answers from pre-test to post-test in both groups was in a positive direction. Almost all the children knew that caries is produced by germs and by eating too much candy. The largest shift in both groups was to "a" that cavities are caused by microorganisms and candy. More in the school group chose "a" and seemed to have a better concept of caries, since many chose "a" in the pre-test thus suggesting that a largest number of children probably had a good perception of caries before viewing the film.

Concerning question #10, some students shifted to the correct answer, and the alternative "a" was the overwhelming choice in both groups. In the visit to the dental unit some students asked for a piece of dental floss and used it as the boys did in the film. These children may have known about floss before the film, as "a" was also the overwhelming choice of both groups in the pre-test.

Comparison of the Four Groups on Their Post-Test Choices

The responses of the school group who did not take the pre-test varied considerably from those of the other three groups. Question 4 was the only one where their answers did not differ significantly from the other, and

"sitting quietly" was the accepted way to behave in the dental office. This group was about two years older on the average than the other groups of the school, and seemed to be a rather cohesive one. They concentrated on the film and seemed to have had considerable previous experience in dental office. Why their answers were so different from the other groups was not so obvious, while they were taking the test there must have been factors present that were not visible, but differentiated them from the other groups.

The variation points up the fact that each group and each individual within the group views the film a bit differently and compares it to this previous experience, blends it within his present environment and comes up with conclusions that may or may not be logical when compared to the total group.

Attitudinal Effects of Viewing the Film

No definitive study has been made to document what actually occurs in the viewers of the film "Teeth are for Keeping". In the author's opinion, the youngsters in the film exhibit somewhat exaggerated and unrealistic behavior, and the question is how much of this will carry over into a real dental situation. Much of the horseplay by the youngsters would not be permitted in a private office. From the very beginning when the boys enter the dental office, they show bad manners and indulge in continuous antics; that caused laughing in the audience when the film was playing, and in the reproduction of the dental office which children of the audience later visited, they displayed much the same, though not destructive, and three boys even used the same language as the boys in the film.

Normally children go to the dentist with their parents or an older responsible person; in the film they slip into the dental office by accident, no parents or responsible person accompanies them, no reception room is shown, and the most important thing is that children cannot learn toothbrush or dental floss technique due to the necessarily very brief explanation of everything. This film is merely an introduction of the children to the dental office, rather than a comprehensive teaching experience. In addition, children who come to a dental office are usually very reserved and do not show the kind of behavior shown in the film. In the author's experience in private practice, there were only two cases of behavior with any resemblance whatever to the behavior in the film, and then it appeared that the children were merely inquisitive, as might be expected at that age. In the present study however, 118 of the 122 children engaged in the inquisitive but not the destructive behavior of the characters in the film they had just seen. This may have been because their minds contained fresh images from the film. This was a short-term experiment; perhaps in a long-term study they would have behaved differently.

If children were to see more films like this, they might use the character in the film as models and begin to mimic their undesirable behavior, but since none of the children mistreated the dental equipment or materials, chances are that more exposure to this type of film would not appreciably change their behavior. On the other hand, three boys used the rough language and this could be a beginning of a possible trend, given a longer exposure period. In my opinion, the film makers need to be careful

when making films because children at this age mimic everything. They generally follow a "monkey sees, monkey does" philosophy but fortunately they did separate out the undesirable aspects of this film.

I do not know what might have happened in a long-term study if the children were to see the same kind of films more often. The children who go to the dentist's office are usually under the control of the parents and they are expected to behave like model children. A large diet of contrary films might cancel out the inhibiting effect of the parents, especially with reference to the inhibition of unacceptable behavior.

One positive result was the interest and familiarity with the dental office and the equipment that practically all children developed during the tour of the mobile dental unit. Three children even wanted to be in all the groups visiting the unit, and they stayed in the dental unit for some time, touching everything and explaining to the new groups, when they asked, how to operate the buttons or equipment without causing any damage. However, each visitation lasted only five minutes, and it could be that if they spent more time, they might have caused damage or behaved differently.

Another point is that the children saw only one film; perhaps if children were to see more films of the same kind, they would become more familiar and mimic even more closely the actions of the children in these films. In this study the children did not break the plaster study models or wrap their companions with the dental floss. They touched the models, as well as the dental floss but they did not misuse materials. Three of the children even took small pieces of dental floss and used it correctly.

It is not unusual to find that the violence in television has an effect upon the viewers; when a particular plan for a bank robbery is shown on television, it may soon be put into effect in real life. There would seem to be a similar likelihood in showing children dental films, that at least a small percentage of them would develop the same behavior and this in turn would become a model for other children.

A good feature of the film is entertainment value, since the children who saw it enjoyed it, as evidenced by their laughing. The black children of the Boys' Clubs, as well as the younger children of both the elementary school and Boys' Clubs groups, enjoyed it the most. The girls in the elementary school seemed much more interested in learning.

The director of the Boys' Clubs, after seeing the film, did not want to give me permission to do my research, showing this kind of film to the children at those clubs. After I explained that this was an experiment to determine whether the boys would really behave as the actors do in the film and to perhaps show the film makers that a film can have a bad influence on children, he gave me permission to conduct the study. He thought, from the beginning, that the boys might follow the exaggerated and unrealistic behavior that they would see in the film.

Incidentally, some children, before and after viewing the film, asked me if I was going to give them toothbrushes or toothpaste. Apparently this was their usual reward after an encounter with the dentist and they were expecting this as "pay" for viewing the film.

The film seemed to be especially interesting for the younger boys ranging in age from 9 to 10 years. Even though the girls and older boys weren't as interested in the film, this did not seem to greatly affect their pre-test and post-test choices. The responses that children gave to the questionnaire were the ones that they give when they go to the dentist's office with their parents. The behavior that they displayed in the mobile dental unit was much more free than would be indicated by their responses to the questionnaire.

The exaggerated behavior of the film's characters did keep the children's attention during the film presentation and the children's familiarity with the equipment in the dental office did increase. The film apparently had considerable value for children for its entertainment as well as its information; and that is probably a desirable feature in educational material designed for this age group. The differences in responses and attitudes observed in white and minority children indicate the wisdom of preparing material individualized for different socio-economic and ethnic groups.

This was only a 15-minute film and in the authors' opinion it would be interesting to show a series of films to see if children's behavior would change. The groups could also be split in half seeing the film and the other half viewing traditional films and make comparisons of their behaviors in the dental unit.

Highlights of the Study Which Were of Value as a Learning Experience For the Author, and Which Deserve Further Studies Were:

1. The entertainment features of the film were of value in that they promoted attention of the children and this resulted in some cognitive and attitudinal gains.

2. There is need of different material for different socio-economic educational and ethnic groups.

3. The students might be shown more than one film to reinforce the dental knowledge and attitudes.

4. The time of the day is important as well as the environment.

5. Attitudes of the personnel helping in the research are important.

6. Familiarity with the equipment and dental offices should be taken into account.

7. Differences between age groups might be studied more thoroughly.

8. A visit to a dental office rather than a mobile dental unit might be in order.

SUMMARY AND CONCLUSIONS

The film, "Teeth are for Keeping" was shown to 362 children of the lower social economic class from five Boys' Clubs and an elementary school in the Indianapolis area. The purpose was to determine the kind of attitudes and behavior that the children would exhibit after viewing the film. It was shown that the film caused a slight increase in knowledge from the pre-test to the post-test results.

The film is mainly an introduction to the dental office, rather than a means of offering specific instruction in dentistry, such as toothbrush technique. It provides entertainment and develops a familiarity of the children concerning dentistry and the dental office.

The exaggerated and unrealistic behavior of the characters displayed in the film seemed to hold the children's attention and they displayed some of the same behavior in their subsequent visit to a dental unit. However, none of the children caused any damage as the children in the film did. They were merely inquisitive. The behavior that the children exhibited in the dental unit did not correspond to what they had indicated in their questionnaire responses about their typical behavior when they go to a dental office with one of their parents.

This was a short-term study and children viewed the film only once, the visitation to the dental office unit was only for five minutes, and the children had much freedom. However, no damage was done to any material or equipment, perhaps because of the short time they spent in the dental unit.

The film seems to reach some desirable objectives. However, it would appear to be desirable to test the effects of such a film in a long-term study.

APPENDIX

Chi Square comparison of the post-test choices on question #1 of the questionnaire for the four groups: school pre- and post-test, school post-test only, clubs pre- and post-test, clubs post-test only.

Post-Test Choices						$f^2_{rk}/f_r f_k$				
	SPP	SP	CPP	CP	f_r	SPP	SP	CPP	CP	Total
a	79	44	73	86	282	.2489	.1040	.2100	.2406	.8033
b	9	18	13	16	56	.0163	.0877	.0335	.0419	.1594
*c+d	1	4	4	7	16	.0007	.0152	.0111	.0281	.0451
Total	89	66	90	109	354	Total .2657	.2069	.2546	.3107	1.0378

*Responses to "c" and "d" were very low and were combined to confirm more closely to the guidelines for using Chi Square.

Chi = (1.0378-1.0) X 354 = 13.3812*

$Chi_{.05}$ (6 df) = 12.592
$Chi_{.01}$ (6 df) = 16.812
$Chi_{.001}$ (6 df) = 22.457

Chi Square comparison of the pre-test and post-test choices on question #1 of the questionnaire for the school and club groups.

Post-Test (f_o)			Pre-Test (f_e)		$(f_o f_e)^2/f_e$			
	School	Club	Both	School	Club	School	Club	Both
a	79	73	152	73	69	.49	.23	.72
b	9	13	22	14	13	1.79	.00	1.79
c+d	3	4	5	2	8	.50	2.00	2.50
Total	89	90	179	89	90	Total 2.78	2.23	5.01 n.s.

$Chi_{.05}$ (2 df) = 5.991
$Chi_{.01}$ (2 df) = 9.210
$Chi_{.001}$ (2 df) =13.815

Chi Square comparison of the post-test choices on question #2 of the questionnaire for the four groups: school pre- and post-test, school post-test only, club pre- and post test, and clubs post-test only.

	Post-Test Choices					$f^2_{rk}/f_r f_k$				
	SPP	SP	CPP	CP	f_r	SPP	SP	CPP	CP	Total
a	37	3	31	34	105	.1465	.0013	.1028	.0992	.3498
b	44	51	38	41	174	.1250	.2265	.0932	.0870	.5317
c	6	12	18	31	67	.0060	.0326	.0543	.1292	.2221
d	2	0	2	5	9	.0050	.0000	.0050	.0250	.0350
Total	89	66	89	111	355	Total .2625	.2604	.2553	.3404	1.1386

$$\text{Chi} = (1.386-1.0) \times 355 = 49.2030^{***}$$

$\text{Chi}_{.05}$ (9 df) = 16.919
$\text{Chi}_{.01}$ (9 df) = 21.666
$\text{Chi}_{.001}$ (9 df) = 27.877

Chi Square comparison of the pre-test and post-test choices on question #2 of the questionnaire for the school and club groups.

	Post-Test (f_o)			Pre-Test (f_e)		$(f_o f_e)^2/f_e$		
	School	Club	Both	School	Club	School	Club	Both
a	37	31	68	17	10	23.53	44.10	67.63
b	44	38	82	60	46	4.27	1.39	5.66
c	6	18	24	11	32	1.33	5.12	6.45
d	2	2	4	1	1	1.00	1.00	2.00
Total	89	89	178	89	89	Total 29.13	50.61	79.74^{***}

$\text{Chi}_{.05}$ (3 df) = 7.82
$\text{Chi}_{.01}$ (3 df) =11.34
$\text{Chi}_{.001}$ (3 df) =16.27

Chi Square comparison of the post-test choices on question #3 of the questionnaire for the four groups: school pre- and post-test, school post-test only, clubs pre- and post-test, clubs post-test only.

	Post-Test Choices					$f^2_{rk}/f_r f_k$				
	P_1	P_2	P_3	P_4	f_r	P_1	P_2	P_3	P_4	Total
*a+b	7	1	17	32	57	.0097	.0003	.0570	.1618	.2278
c	78	56	66	65	265	.2580	.1793	.1847	.1436	.7656
d	4	9	6	14	33	.0054	.0372	.0123	.0535	.1084
Total	89	66	89	111	355	.2231	.2168	.2530	.3589	1.1018
						Total				

*Responses to "a" and "b" were very low and were combined to confirm more closely to the guidelines for using Chi Square.

Chi = (1.1018-1.0) X 355 = 36.1390***

$Chi_{.05}$ (6 df) = 12.592
$Chi_{.01}$ (6 df) = 16.812
$Chi_{.001}$ (6 df) = 22.457

Chi Square comparison of the pre-test and post-test choices on question #3 of the questionnaire for the school and club groups.

	Post-Test (f_o)			Pre-Test (f_e)		$(f_o f_e)^2/f_e$		
	School	Club	Both	School	Club	School	Club	Both
a+b	7	17	24	6	8	.17	10.12	10.29
c	78	66	144	71	68	.69	.06	.75
d	4	6	10	12	13	5.33	3.77	9.10
Total	89	89	178	89	89	6.19	13.95	20.14***
						Total		

$Chi_{.05}$ (2 df) = 5.991
$Chi_{.01}$ (2 df) = 9.210
$Chi_{.001}$ (2 df) =13.815

Chi Square comparison of the post-test choices on question #4 of the questionnaire for the four groups: school pre- and post-test, school post-test only, clubs pre- and post-test, clubs post-test only.

	Post-Test Choices					$f^2_{rk}/f_r f_k$				
	P_1	P_2	P_3	P_4	f_r	P_1	P_2	P_3	P_4	Total
a	9	12	9	10	40	.0228	.0545	.0228	.0227	.1228
b	9	8	13	18	48	.0190	.0202	.0396	.0614	.1402
c	66	44	66	70	246	.1990	.1192	.1990	.1811	.6983
d	5	2	1	12	20	.0140	.0030	.0006	.0655	.0831
Total	89	66	89	110	354	Total .2548	.1969	1.2620	.3307	1.0444

Chi = (1.0444-1.0) X 354 = 15.7176 n.s.
$Chi_{.05}$ (9 df) = 16.919
$Chi_{.01}$ (9 df) = 21.666
$Chi_{.001}$ (9 df) = 27.877

Chi Square comparison of the pre-test and post-test choices on question #4 of the questionnaire for the school and club groups.

	Post-Test (f_o)			Pre-Test (f_e)		$(f_o f_e)^2/f_e$		
	School	Club	Both	School	Club	School	Club	Both
a	9	9	18	4	2	6.25	24.50	30.75
b	9	13	22	9	9	.00	1.78	1.78
c	66	66	132	69	75	.13	.12	.25
d	5	1	6	5	3	.00	1.33	1.33
Total	89	89	198	87	89	Total 6.38	28.73	34.11***

$Chi_{.05}$ (3 df) = 7.82
$Chi_{.01}$ (3 df) =11.34
$Chi_{.001}$ (3 df) =16.27

Chi Square comparison of the post-test choices on question #5 of the questionnaire for the four groups: school pre- and post-test, school post-test only, clubs pre- and post-test, and clubs post-test only.

Post-Test Choices						$f^2_{rk}/f_r f_k$				
	SPP	SP	CPP	CP	f_r	SPP	SP	CPP	CP	Total
a	11	6	11	18	46	.0296	.0119	.0292	.0635	.1342
b	9	4	12	15	40	.0228	.0061	.0400	.0507	.1196
c	38	21	33	31	123	.1389	.0543	.0984	.0704	.3620
d	31	35	34	47	147	.0735	.1263	.0874	.1354	.4226
Total	89	66	90	111	356	.2648	.1986	.2550	.3700	1.0384

Total

Chi = (1.0384-1.0) X 356 = 13.670 n.s.

$Chi_{.05}$ (9 df) = 16.919
$Chi_{.01}$ (9 df) = 21.666
$Chi_{.001}$ (9 df) = 27.877

Chi Square comparison of the pre-test and post-test choices on question #5 of the questionnaire for the school and club groups.

Post-Test (f_o)				Pre-Test (f_e)		$(f_o f_e)^2/f_e$		
	School	Club	Both	School	Club	School	Club	Both
a	11	11	22	11	9	0.00	.44	.44
b	9	12	21	6	5	1.50	9.80	10.30
c	38	33	71	40	23	.10	4.35	4.45
d	31	34	65	32	53	.03	6.81	6.84
Total	89	90	179	89	90	1.63	21.40	23.03***

Total

$Chi_{.05}$ (3 df) = 7.82
$Chi_{.01}$ (3 df) =11.34
$Chi_{.001}$ (3 df) =16.27

Chi Square comparison of the post-test choices on question #6 of the questionnaire for the four groups: school pre- and post-test, school post-test only, clubs pre- and post-test, and clubs post-test only.

Post-Test Choices						$f^2_{rk}/f_r f_k$				
	P_1	P_2	P_3	P_4	f_r	P_1	P_2	P_3	P_4	Total
*a+b	34	9	34	64	141	.0921	.0087	.0921	.2617	.4546
c	47	52	45	39	183	.1356	.2239	.1243	.0749	.5587
d	8	5	10	8	31	.0232	.0122	.0362	.0186	.0902
Total	89	66	89	111	355	.2509	.2448	.2526	.3552	1.1035
						Total				

*Responses to "a" and "b" were very low and were combined to confirm more closely to the guidelines for using Chi Square.

Chi = (1.1035-1.0) X 355 = 36.7425***

$Chi_{.05}$ (6 df) = 12.592

$Chi_{.01}$ (6 df) = 16.812

$Chi_{.001}$ (6 df) = 22.457

Chi Square comparison of the pre-test and post-test choices on question #6 of the questionnaire for the school and club groups.

Post-Test (f_o)			Pre-Test (f_e)		$(f_o f_e)^2/f_e$		
	School	Club	Both	School	Club	School	Club	Both
a+b	34	34	68	40	34	.90	.00	.90
c	47	45	92	41	48	.88	.19	1.07
d	8	10	18	8	7	.00	1.28	1.28
Total	89	89	178	89	89	1.78	1.47	3.25 n.s.
						Total		

$Chi_{.05}$ (2 df) = 5.991

$Chi_{.01}$ (2 df) = 9.210

$Chi_{.001}$ (2 df) =13.815

Chi Square comparison of the post-test choices on question #7 of the questionnaire for the four groups: school pre- and post-test, school post-test only, clubs pre- and post-test, and clubs post-test only.

Post-Test Choices					
	P_1	P_2	P_3	P_4	f_r
*a+b	10	3	15	34	62
c	53	53	51	53	210
d	26	10	23	24	83
Total	89	66	89	111	355

$f^2_{rk}/f_r f_k$				
P_1	P_2	P_3	P_4	Total
.0018	.0022	.0408	.1680	.2128
.1502	.2027	.1392	.1205	.6126
.0915	.0183	.0716	.0625	.2439
.2435	.2232	.2516	.3500	1.0693

Total

*Responses to "a" and "b" were very low and were combined to confirm more closely to the guidelines for using Chi Square.

Chi = (1.0693-1.0) X 355 = 24.6015***

$Chi_{.05}$ (6 df) = 12.592
$Chi_{.01}$ (6 df) = 16.812
$Chi_{.001}$ (6 df) = 22.457

Chi Square comparison of the pre-test and post-test choices on question #7 of the questionnaire for the school and club groups.

Post-Test (f_o)			Pre-Test (f_e)	
	School	Club	Both	School	Club
a+b	10	15	25	8	10
c	53	51	104	48	51
d	26	23	49	33	28
Total	89	89	178	89	89

$(f_o f_e)^2/f_e$			
School	Club	Both	
.50	2.50	3.00	
.52	.00	.52	
1.48	.89	2.37	
2.50	2.39	5.89	n.s.

Total

$Chi_{.05}$ (2 df) = 5.991
$Chi_{.01}$ (2 df) = 9.210
$Chi_{.001}$ (2 df) =13.815

Chi Square comparison of the post-test choices on question #8 of the questionnaire for the four groups: school pre- and post-test, school post-test only, clubs pre- and post-test, clubs post-test only.

	Post-Test Choices					$f^2_{rk}/f_r f_k$				
	P_1	P_2	P_3	P_4	f_r	P_1	P_2	P_3	P_4	Total
a	38	43	24	29	134	.1211	.1698	.0483	.0565	.3957
b	19	6	18	24	67	.0605	.0081	.0543	.0775	.2004
c	26	17	39	49	131	.0580	.0334	.1305	.1651	.3870
d	6	0	8	9	23	.0176	.0000	.0313	.0317	.0806
Total	89	66	89	111	355	Total .2572	.2113	.2644	.3308	1.0637

Chi = (1.0637-1.0) X 355 = 22.6135**
$Chi_{.05}$ (9 df) = 16.919
$Chi_{.01}$ (9 df) = 21.666
$Chi_{.001}$ (9 df) = 27.877

Chi Square comparison of the pre-test and post-test choices on question #8 of the questionnaire for the school and club groups.

	Post-Test (f_o)			Pre-Test (f_e)		$(f_o f_e)^2/f_e$		
	School	Club	Both	School	Club	School	Club	Both
a	38	24	62	41	26	.22	.15	.37
b	19	18	37	11	24	5.82	1.50	7.32
c	26	39	65	23	28	.39	4.32	4.71
d	6	8	14	14	11	4.57	.82	5.39
Total	89	89	178	89	89	Total 11.00	6.79	17.79***

$Chi_{.05}$ (3 df) = 7.82
$Chi_{.01}$ (3 df) =11.34
$Chi_{.001}$ (3 df) =16.27

Chi Square comparison of the post-test choices on question #9 of the questionnaire for the four groups: school pre- and post-test, school post-test only, clubs pre- and post-test, and clubs post-test only.

Post-Test Choices						$f^2_{rk}/f_r f_k$				
	P_1	P_2	P_3	P_4	f_r	P_1	P_2	P_3	P_4	Total
a	51	55	35	38	179	.1633	.2561	.0769	.0727	.5690
b	31	9	39	49	138	.0782	.0089	.1238	.1567	.3676
*c+d	7	2	15	24	48	.0115	.0013	.0527	.1081	.1736
Total	89	66	89	111	355	Total .2530	.2663	.2534	.3375	1.1102

*Responses to "c" and "d" were very low and were combined to confirm more closely to the guidelines for using Chi Square.

$Chi = (1.1102-1.0) \times 355 = 39.121^{***}$

$Chi_{.05}$ (6 df) = 12.592
$Chi_{.01}$ (6 df) = 16.812
$Chi_{.001}$ (6 df) = 22.457

Chi Square comparison of the pre-test and post-test choices on question #9 of the questionnaire for the school and club groups.

Post-Test (f_o)				Pre-Test (f_e)		$(f_o f_e)^2/f_e$		
	School	Club	Both	School	Club	School	Club	Both
a	51	35	86	44	26	1.11	3.12	4.23
b	31	39	70	38	41	1.29	.10	1.39
c+d	7	15	22	7	22	.00	2.23	2.23
Total	89	89	178	89	89	Total 2.40	5.45	7.85*

$Chi_{.05}$ (2 df) = 5.991
$Chi_{.01}$ (2 df) = 9.210
$Chi_{.001}$ (2 df) =13.815

Chi Square comparison of the post-test choices on question #10 of the questionnaire for the four groups: school pre- and post-test, school post-test only, clubs pre- and post-test, and clubs post-test only.

	Post-Test Choices					$f^2_{rk}/f_r f_k$				
	P_1	P_2	P_3	P_4	f_r	P_1	P_2	P_3	P_4	Total
a	71	60	43	54	228	.2484	.2392	.1453	.1152	.7481
b	4	0	11	16	31	.0058	.0000	.0444	.0744	.1246
c	7	2	21	25	55	.0100	.0011	.0911	.1107	.2129
d	7	4	13	16	40	.0138	.0061	.0480	.0577	.1256
Total	89	66	88	111	354	Total .2780	.2464	.3288	.3580	1.2112

Chi = (1.2112-1.0) X 354 = 74.7648***
$Chi_{.05}$ (9 df) = 16.919
$Chi_{.01}$ (9 df) = 21.666
$Chi_{.001}$ (9 df) = 27.877

Chi Square comparison of the pre-test and post-test choices on question #10 of the questionnaire for the school and club groups.

	Post-Test (f_o)			Pre-Test (f_e)		$(f_o f_e)^2/f_e$		
	School	Club	Both	School	Club	School	Club	Both
a	71	43	114	65	50	.55	.73	1.28
b	4	11	15	3	15	.33	1.07	1.40
c	7	21	28	10	13	.90	4.92	5.82
d	7	13	20	11	11	1.45	.36	1.81
Total	89	88	177	89	89	Total 3.23	7.08	10.31*

$Chi_{.05}$ (3 df) = 7.82
$Chi_{.01}$ (3 df) =11.34
$Chi_{.001}$ (3 df) =16.27

FIGURE I. INTERIOR OF THE MOBILE DENTAL UNIT

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CURRICULUM VITAE

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June 15, 1962	B.A., Sonora University, Hermosillo, Mexico
June 15, 1971	D.D.S., University of Mexico, School of Dentistry, Mexico, D.F.
May 18, 1976	M.S.D. (Pedodontics), Indiana University School of Dentistry, Indianapolis, Indiana
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American Society of Dentistry for Children
Mexican Dental Association

ABSTRACT

The film "Teeth are for Keeping" was shown to 362 children from five Boys' Clubs and an elementary school. They ranged in age from 8 to 16, and all were from families of a lower socio-economic background, residing in the Indianapolis area.

The film provides the children with entertainment and created familiarity with the dentist and the dental environment. It was intended merely to introduce the children to the dental office, rather than to give them specific instructions about dental education.

In their visit to the dental unit, most of the children were inquisitive and anxious to manipulate the different equipment. Black children and younger individuals among the white children gave the most evidence of enjoying the film. The film seems to reach the objectives of entertainment and increased familiarity with the dental equipment and dental offices.

The unusual situations in the film, such as horseplay, were not followed to the destructive levels by the children. On the other hand, it appears that such films should be carefully studied for their effects upon young viewers.